



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246

2

D350-748-143TRN
Job Sheet 191083



Part No: D350-748-143TRN

Job Qty: 1 pcs

Part Name: Ss Crosstube Turning Detail



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 2/21/19

Job Tracking No:

Created By: Marie Lajeunesse

Due Date: 4/12/19

Description:

Type: Stock

Note: DWG REV A IPP REV.A NEW ISSUE - LL 12.05.08

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
100	Mori Selkl TL-40 - 1	1 pcs	4/12/19	4/12/19	7.06	2.81	Mori Selkl TL-40 - 1		DAS 662019-06-06
110	QC 2	1 pcs	4/12/19	4/12/19	0.00	0.00	QC 2 - 1		9-89
							QC 2 - 12		
							QC 2 - 14		
							QC 2 - 17		
							QC 2 - 19		
							QC 2 - 2		
							QC 2 - 20		
							QC 2 - 22		
							QC 2 - 23		
							QC 2 - 25		
							QC 2 - 32		
							QC 2 - 33		
							QC 2 - 35		
							QC 2 - 39		
							QC 2 - 4		
							QC 2 - 40		
							QC 2 - 44		
							QC 2 - 45		
							QC 2 - 48		
							QC 2 - 49		
							QC 2 - 50		
							QC 2 - 51		
							QC 2 - 52		
							QC 2 - 54		
							QC 2 - 56		
							QC 2 - 57		
							QC 2 - 62		
							QC 2 - 63		
							QC 2 - 8		DAS
							QC 2 - 66		662019-06-06
									8-89

Plex 2/21/19 9:25 AM Dart.lajeunesse.marie

				QC 2 - 64	DAS	
120	Mori Seiki TL-40 - 1 - B4B	1 pcs	4/12/19	0.00 2.81	Mori Seiki TL-40 - 1 - B4B	662019-06-10
130	QC 2	1 pcs	4/12/19	0.00 0.00	QC 2 - 1	9-89
				QC 2 - 12		
				QC 2 - 14		
				QC 2 - 17		
				QC 2 - 19		
				QC 2 - 2		
				QC 2 - 20		
				QC 2 - 22		
				QC 2 - 23		
				QC 2 - 25		
				QC 2 - 32		
				QC 2 - 33		
				QC 2 - 35		
				QC 2 - 39		
				QC 2 - 4		
				QC 2 - 40		
				QC 2 - 44		
				QC 2 - 45		
				QC 2 - 48		
				QC 2 - 49		
				QC 2 - 50		
				QC 2 - 51		
				QC 2 - 52		
				QC 2 - 54		
				QC 2 - 56		
				QC 2 - 57		
				QC 2 - 62		
				QC 2 - 63		
				QC 2 - 8	DAS	
				QC 2 - 66	662019-06-11	
				QC 2 - 64	9-89	
140	QC 8	1 pcs	4/12/19	0.00 0.00	QC 8 - 12	
				QC 8 - 14		
				QC 8 - 17		
				QC 8 - 20		
				QC 8 - 25		
				QC 8 - 3		
				QC 8 - 32		
				QC 8 - 33		
				QC 8 - 35		
				QC 8 - 39		
				QC 8 - 4		
				QC 8 - 44		
				QC 8 - 45		
				QC 8 - 49		
				QC 8 - 58		
				QC 8 - 8		
				QC 8 - 9		
				QC 8 - 68	DAS	
				QC 8 - 67	6719-06-12	
				QC 8 - 1 (A)	9-89	
				QC 8 - 47		
150	Crosstubes - 2 - B4B	1 pcs	4/12/19	0.00 0.97	Crosstubes - 1 - B4B	
				Crosstubes - 2 - B4B		
				Crosstubes - 3 - B4B		
				Crosstubes - 4 - B4B		
190	Packaging 3-1 - Stock - B4B	1 pcs	4/12/19	0.00 0.00	Packaging 3 - 1 - B4B	

				Packaging 3 - 2 - B4B	
				Packaging 3 - 3 - B4B	
				Packaging 3 - 4 - B4B	
				Packaging 3 - 5 - B4B	
				Packaging 3 - 6 - B4B	
				Packaging 3 - 7 - B4B	
				Packaging 3 - 8 - B4B	
				Packaging 3 - 9 - B4B	
				Packaging 3 - 10 - B4B	
				Packaging 3 - 11 - B4B	
				Packaging 3 - 12 - B4B	
				Packaging 3 - 13 - B4B	
				Packaging 3 - 14 - B4B	
				Packaging 3 - 15 - B4B	
				Packaging 3 - 16 - B4B	
				Packaging 3 - 17 - B4B	
				Packaging 3 - 18 - B4B	
				Packaging 3 - 19 - B4B	
				Packaging 3 - 20 - B4B	
				Packaging 3 - 21 - B4B	
				Packaging 3 - 22 - B4B	
				Packaging 3 - 23 - B4B	
				Packaging 3 - 24 - B4B	
				Packaging 3 - 25 - B4B	
				Packaging 3 - 26 - B4B	
				Packaging 3 - 27 - B4B	
				Packaging 3 - 28 - B4B	
				Packaging 3 - 29 - B4B	
				Packaging 3 - 30 - B4B	
				Packaging 3 - 31 - B4B	
				Packaging 3 - 32 - B4B	
				Packaging 3 - 33 - B4B	
				Packaging 3 - 34 - B4B	
				Packaging 3 - 35 - B4B	
200 QC 21 - SA	1 pcs	4/12/19	0.00 0.00	QC 21 - SA - 21	
				QC 21 - SA - 70	
				QC 21 - SA - 53	

Part Op 100 - (Mori Seiki CNC Lathe Large) 1-Cut tube on chop saw, leave extra mat'l for facing and install plugs 350-141 on both ends. 2-Face both sides of tube. 3- Turn program 02000 section on both side as per folio FB467. 4- Turn program 03000 section on both side as per folio FB467. 5- Blend transition lines only with belt sander 60 grit Folio rev: A

Dwg rev: A

110 - (QC2- Inspect parts off machine FAI/FAIB)

120 - (Mori Seiki CNC Lathe Large) 1- Turn program 04000 section on both side as per folio FB467. 2- Blend transition lines only with belt sander 60 grit 3- Scribe part # as per Dwg D350-748-143 Folio rev: A Dwg rev: A

130 - (QC2- Inspect parts off machine FAI/FAIB) PERFORME ULTRASONIC MEASUREMENT

140 - (QC8- Inspect parts - second check)

150 - (Crosstubes) 1-Grind machining marks

190 - (Identify as per dwg & Stock Location: _____) Identify and stock in kanban rack

200 - (QC21- Final Inspection - Work Order Release)

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D6021-125	Crosstube Material - 17-4Ph SS	1 pcs (1 ea)	100-Mori Seiki TL-40 - 1	F151691

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
100-Mori Seiki TL-40 - 1	D6021-125	1	47	0

Part Specifications

Specifications could not be found.

**Container No: S188410****Part: D350-748-143TRN****Job No: 191083****Serial No/Batch: S188410****Revision: A****Inspector:****Exp Date:****Instructions:**

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL.: 1 813 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

Plex 2/21/19 9:25 AM Dart.lajeunesse.marie

Date: 06/06/19

2

DART AEROSPACE LTD		Work Order: 191083
Description: Crosstube Assembly (AS350/355 High Fwd SS)		Part Number: D350-748-143
Inspection Dwg: D350-748-143 Rev: A		Page 1 of 2

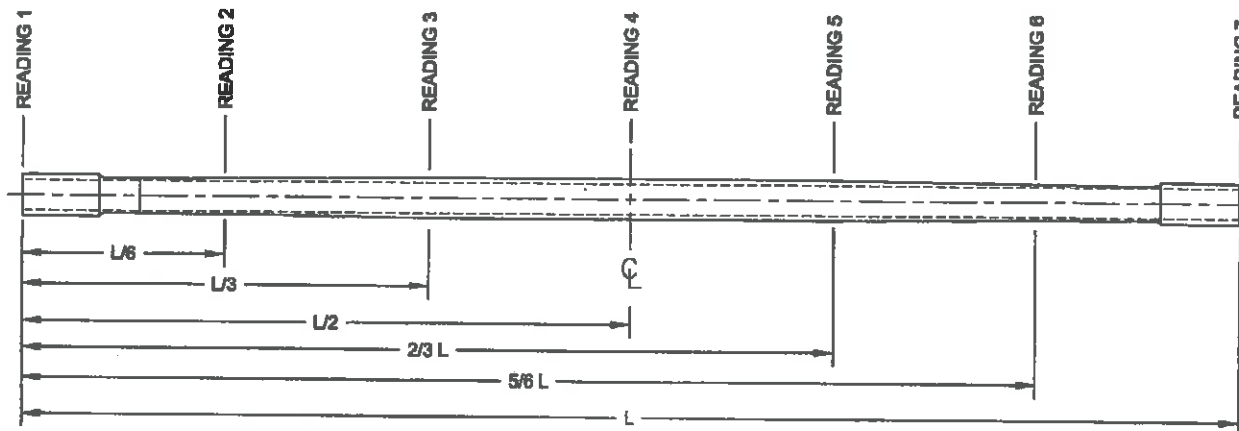
FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+/-0.005	2.240	✓		CNC-04	
	2.180	+0.005/-0.000	2.185	✓			
	2.180	+0.005/-0.000	2.185	✓			
	2.237	+0.005/-0.000	2.242	✓			
	2.272	+0.005/-0.000	2.277	✓			
	2.306	+0.005/-0.000	2.311	✓			
	2.339	+0.007/-0.000	2.346	✓			
	2.339	+0.007/-0.000	2.346	✓			
	0.062	+/-0.010	.062	✓		CNC-08	
	5.25	+/-0.060	5.246	✓		"	
	R0.063	+/-0.010	.063	✓		AG	
	R0.50	+/-0.030	.500	✓		"	
SIDE B	2.240	+/-0.005	2.240	✓		CNC-04	
	2.180	+0.005/-0.000	2.185	✓			
	2.180	+0.005/-0.000	2.185	✓			
	2.237	+0.005/-0.000	2.242	✓			
	2.272	+0.005/-0.000	2.277	✓			
	2.306	+0.005/-0.000	2.311	✓			
	2.339	+0.007/-0.000	2.346	✓			
	2.339	+0.007/-0.000	2.346	✓			
	0.062	+/-0.010	.062	✓		CNC-08	
	5.25	+/-0.060	5.253	✓		"	
	R0.063	+/-0.010	.063	✓		AG	
	R0.50	+/-0.030	.500	✓		"	
	112.27	+/-0.060	112.27	✓		Tape	

②

DART AEROSPACE LTD		Work Order:	191083
Description: Crosstube Assembly (AS350/355 High Fwd SS)		Part Number:	D350-748-143
Inspection Dwg: D350-748-143 Rev: A		Page 2 of 2	

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.143	.142	.141	.136	.007	0.030"
READING 2 L= 18.71	.155	.154	.145	.141	.014	
READING 3 L= 37.42	.197	.195	.199	.201	.006	
READING 4 L= 56.14	.189	.193	.196	.201	.012	
READING 5 L= 74.85	.195	.193	.195	.197	.004	
READING 6 L= 93.56	.141	.151	.157	.142	.016	
READING 7 L= 112.27	.136	.141	.149	.143	.013	

Calibration Result

Actual Block Thickness: 100-200

Sitiescan 250 Measured Thickness: 100-200

Measured by: DAS 66

Date: 2019-06-11

Audited by: DAS 67 DB

Date: 9-89 19-06-12

Preliminary Approval:

Date:

Rev	Date	Change	Revised by	Approved
A	15.09.09	New Issue (P/O D350-748-103)	KJ	

Item	Qty	Part Number	Description
	-143		
	X	D350-748-143	CROSSTUBE ASSEMBLY (AS 350355 HI FWD)
1	1	D3021-125	CROSSTUBE
2	2	D3502-1	SUPPORT
3	2	D5123-7	CLAMP CUSHION
4	1	AETC-1032	INSERT
5	2	MS21920-20	CLAMP (PER DART SPEC. MMSZ1920-20-21-22)
6	1	OR MS21920-21-22	
7	1	NAS1149C0363R	WASHER (OR AN650C10)
8	1	NAS1635-3-8	SCREW (OR MS51859-83)
9	AIR	PROSEAL 880 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D3021-125 (17-4PH)
- 2) FINISH: FINISHED LENGTH AFTER TURNING = 112.27(±0.08) (AFTER BENDING/TRIMMING = 110.27 REF)
- 3) TOLERANCE: PER DART Q81 018 UNLESS OTHERWISE NOTED.
WALL THICKNESS ECCENTRICITY PER DART Q81 038 7.2
MIN. ALLOWABLE WALL IS -0.020 FROM NOMINAL
UNITS: INCHES UNLESS OTHERWISE NOTED.
- 4) BREAK SHARP EDGES: 0.015 TO 0.010 MAX.
- 5) IDENTIFICATION: DART PART NUMBER "D350-748-143" AND BATCH NUMBER ON INSIDE OF CUFF
- 6) WEIGHT: 30.45 lbs
PER DART Q81 044 8.4 (VIBRATING STYLUS)
- 7) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.290 HOLE.
- 8) SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLEND OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 9) TURNING
BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BENDING
11) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES PER SIDE. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D. ON TOP HALF OF BEND, AND 8% ON BOTTOM HALF OF BEND.
12) MAX AMPLITUDE OF RIPPING ALONG BENT PORTION OF THE TUBE IS 0.030 (ZN A1-3)
13) MAX TWIST: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.39 (ZN C1-3).
- 14) ASSEMBLY
TO INSTALL D3021-125 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.02" TO 0.05" THICK LAYER OF PROSEAL 880 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
15) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 880 SEALANT HAS CURED FOR 72 HOURS.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. 19108345
1902-01

UNDER REVIEW

DATE 15/11/24
OFF H. 521

DEO ATTACHED

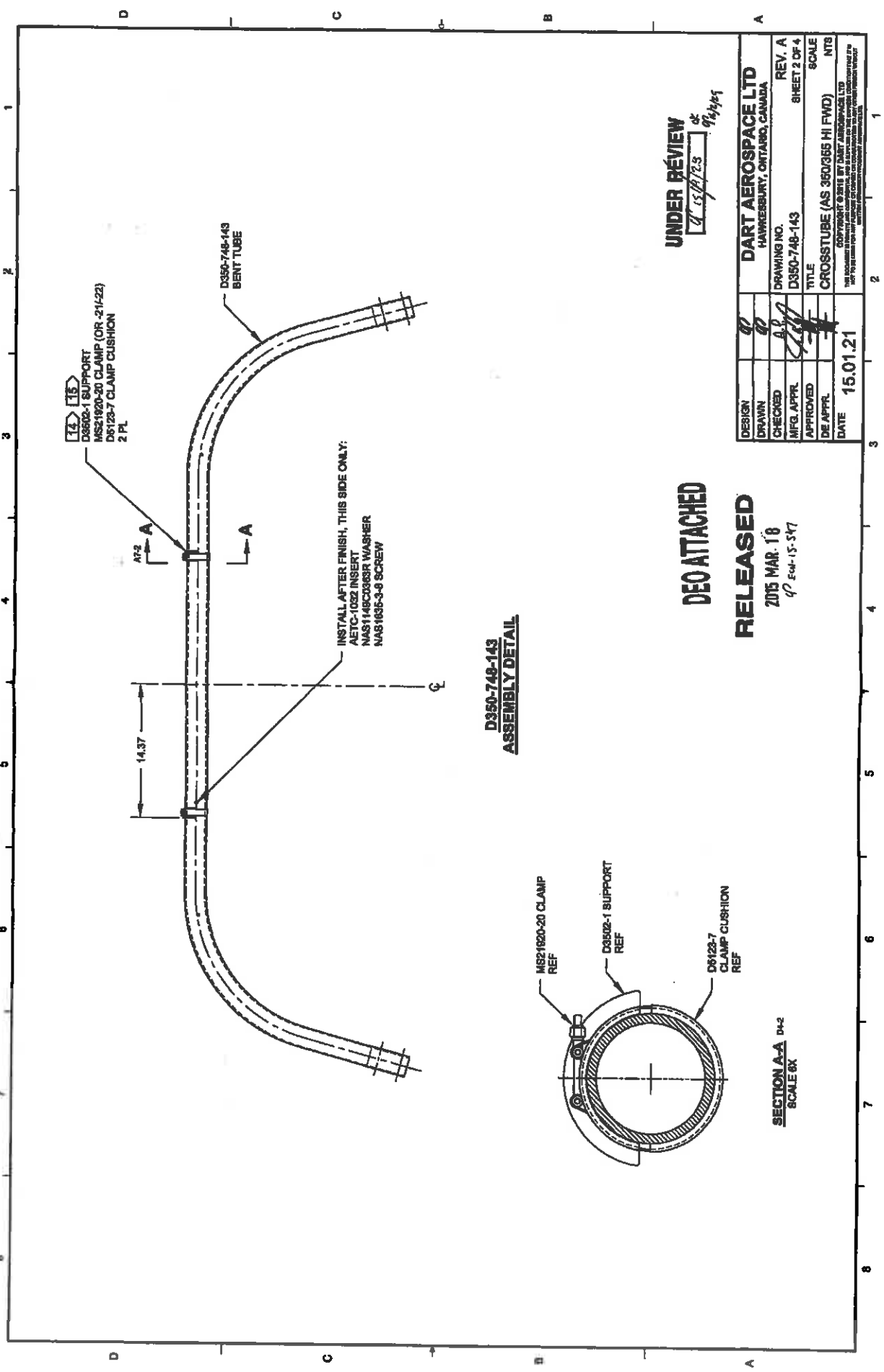
RELEASED

2015 MAR. 18

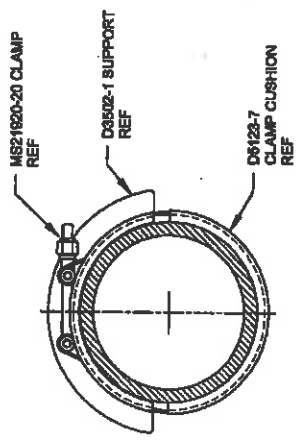
4/2015-547

REV. A	NEW ISSUE	DESCRIPTION	CP	BY	DATE
DESIGN					
DRAWN					
CHECKED					
INFO. APPR.					
APPROVED					
DE APPR.					
DATE	15.01.21				

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO.	D350-748-143
TITLE	CROSSTUBE (AS 350355 HI FWD)
SCALE	NTS
SHEET 1 OF 4	



**D350-748-143
ASSEMBLY DETAIL**



SECTION A-A
SCALE 6X

UNDER REVIEW
15/07/25
9/6/25

DEO ATTACHED

RELEASED

2015 MAR 18
9/6/25-547

DESIGN	00	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
DRAWN	00	REV. A
CHECKED	00	DRAWING NO. D350-748-143 SHEET 2 OF 4
MFG. APPL	00	TITLE
APPROVED	00	CROSS TUBE (AS 350/365 HI FWD)
DATE	15.01.21	SCALE
		NTS

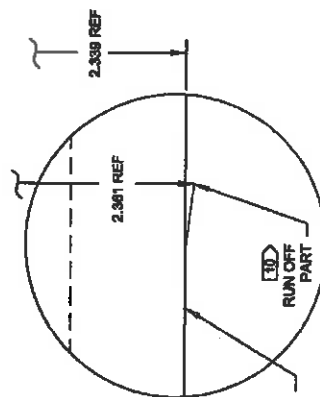
THIS DOCUMENT IS PROPERTY OF DART AEROSPACE LTD
IT IS TO BE KEPT IN CONFIDENTIALITY AND NOT TO BE
REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY
MEANS, ELECTRONIC OR MECHANICAL, INCLUDING
PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION
SYSTEMS WITHOUT PERMISSION IN WRITING FROM
DART AEROSPACE LTD



RELEASED

2015 MAR 18

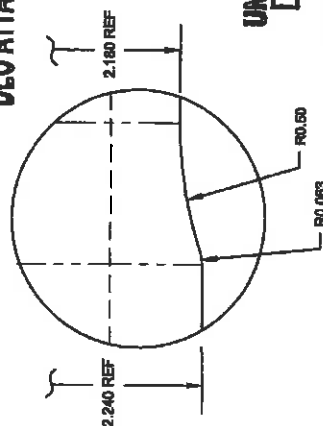
DEO ATTACHED



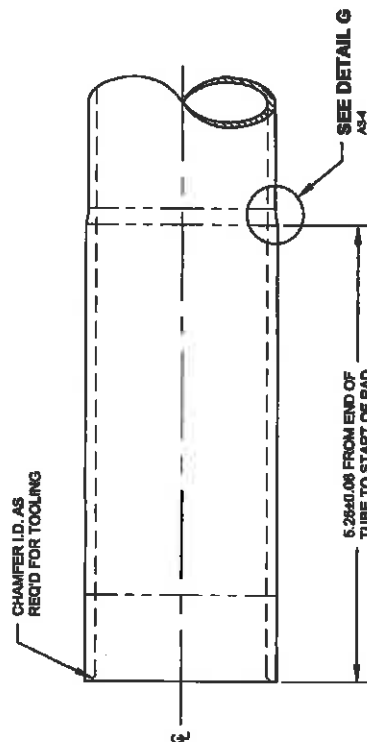
DETAIL F:
TOOL RUN-OFF
NOT TO SCALE

UNDER REVIEW

15/14/128



DETAIL G:
CUFF TRANSITION A3-4
NOT TO SCALE



DETAIL E:
CROSSTUBE CUFF C7-1
SCALE 3X

DESIGN	40	DART AEROSPACE LTD			
DRAWN	40	HAWKESBURY, ONTARIO, CANADA			
CHECKED	40	DRAWING NO.	DS60-748-143	REV. A	SHEET 4 OF 4
INFO. APPR.	40	TITLE			
APPROVED	40	CROSSTUBE (AS 350/355 HI FWD) NTS			
DATE	15.01.21	CONFIRMED 0.2015 BY DART AEROSPACE LTD THIS DRAWING IS THE PROPERTY OF DART AEROSPACE LTD NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM DART AEROSPACE LTD			

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE
DATE 08-20-2010 BY 60322 UCBAW/STP/STP

DRAWING NO. D350-748-143	TITLE CROSSTUBE	REV. A	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D350-748-143-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN 90	CHECKED AS		MFG. APPR. <i>[Signature]</i>	APPROVED <i>[Signature]</i>		DE APPR. <i>[Signature]</i>	
DATE 15.11.18	DATE 15.11.18		DATE 16.02.19	DATE FEB 19 2016		DATE 2016.02.19	

AMEND NOTE 2 (SHEET 1) AS FOLLOWS:

2) FINISH: PREPARE SURFACE PER DART QSI 005 4.1.4
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

OR

POWDER COAT WHITE (4.3.5.2) PER DART QSI 005 4.3

RELEASED
2016-02-26
EN 16-534